



Carbon Biosequestration at LBNL

2009 Berkeley Lab Strategic Plan: Center for Carbon Sequestration (White paper - Biosequestration)

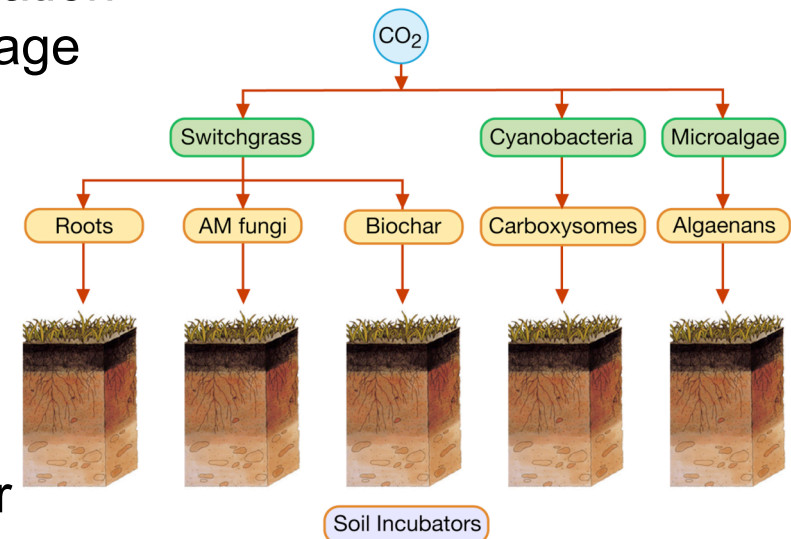
- Mechanisms of soil C inputs & stabilization
- Enhance biological C uptake and storage
- Reduce vulnerability to loss of soil C

Berkeley Lab Strategic LDRD

- Fundamental discovery: C fixation and C stabilization
- Integrate and Showcase Berkeley Lab expertise to lay foundation for a Center for Biosequestration Research
(ESD, MSD, LSD, JBEI, JGI, ALS, Molecular Foundry)

Ongoing project example (ESD and JGI)

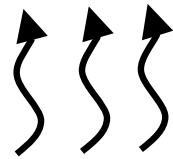
- Release of trapped carbon in permafrost soil during warming
- Metagenomics of active microbial communities in Alaskan permafrost



Permafrost Carbon Sequestration and the Global Carbon Cycle

800 Gt Atmospheric Carbon

6 Gt annual
release



350 Gt in all the world's
forests



960 Gt sequestered
in permafrost

Thaw-induced microbial
decomposition of soil organic
carbon is predicted to release
large quantities of CO₂ and
methane

Critical Questions:

How much carbon will be released by
global warming induced thaw?
What is the rate of release?
Predict impact on climate change?
Adaptation and mitigation strategies?